WHAT IS CLAIMED IS:

1. A waveguide optical device comprising a waveguide for guiding light, wherein

said waveguide comprises a ridge waveguide portion formed as a substantially stripe convex portion extending in a guiding direction, and a gain waveguide portion which guides light in a gain region optically coupled with said ridge waveguide portion.

2. A device according to claim 1, further comprising:

an electrode formed on the upper surface of said waveguide;

an extended portion extending from said gain waveguide portion in the lateral direction of said waveguide; and

an electrode pad connected to said electrode and extending on the upper surface of said extended portion.

3. A device according to claim 2, wherein the resistance in at least a portion of said extended portion is increased to suppress injection of an electric current from said electrode pad.

4. A device according to claim 3, wherein the length of said gain waveguide portion is not more than 1/10 the overall length of said waveguide.

5. A device according to claim 4, further comprising a diffraction grating formed along said waveguide to give optical perturbation to light to be guided,

wherein said gain waveguide portion has a substantially phase shift effect on light guided in said waveguide.

6. A device according to claim 5, wherein said waveguide optical device is a distributed feedback laser which generates laser oscillation in said waveguide, and the phase shift effect of said gain waveguide portion changes in accordance with a bias current or threshold current supplied to said laser.

7. A device according to claim 6, wherein the change in the phase shift effect is so produced as to cancel chirping.

8. A device according to claim 2, wherein an insulating layer is formed between said electrode pad and at least a part of said extended portion, in order to suppress injection of an electric current from said electrode pad.

9. A device according to claim 8, wherein the length of said

gain waveguide portion is not more than 1/10 the overall length of said waveguide.

10. A device according to claim 9, further comprising a diffraction grating formed along said waveguide to give optical perturbation to light to be guided,

wherein said gain waveguide portion has a substantially phase shift effect on light guided in said waveguide.

11. A device according to claim 10, wherein said waveguide optical device is a distributed feedback laser which generates laser oscillation in said waveguide, and the phase shift effect of said gain waveguide portion changes in accordance with a bias current or threshold current supplied to said laser.

12. A device according to claim 11, wherein the change in the phase shift effect is so produced as to cancel chirping.

13. A device according to claim 2, wherein the length of said gain waveguide portion is not more than 1/10 the overall length of said waveguide.

14. A device according to claim 2, further comprising a diffraction grating formed along said waveguide to give optical perturbation to light to be guided,

wherein said gain waveguide portion has a substantially phase shift effect on light guided in said waveguide.

15. A device according to claim 1, wherein the length of said gain waveguide portion is not more than 1/10 the overall length of said waveguide.

16. A device according to claim 15, further comprising a diffraction grating formed along said waveguide to give optical perturbation to light to be guided,

wherein said gain waveguide portion has a substantially phase shift effect on light guided in said waveguide.

17. A device according to claim 16, wherein said waveguide optical device is a distributed feedback laser which generates laser oscillation in said waveguide, and the phase shift effect of said gain waveguide portion changes in accordance with a bias current or threshold current supplied to said laser.

18. A device according to claim 17, wherein the change in the phase shift effect is so produced as to cancel chirping.